IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

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| BIO-RAD LABORATORIES, INC. and THE UNIVERSITY OF CHICAGO,<br><br>Plaintiffs,<br><br>v.<br><br>10X GENOMICS, INC.,<br><br>Defendant. | C.A. No. 15-152-RGA<br><br>REDACTED<br>PUBLIC VERSION |

**10X GENOMICS, INC.'S ANSWERING BRIEF IN OPPOSITION TO PLAINTIFFS' MOTION FOR SUMMARY JUDGMENT**


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## I. STATEMENT OF NATURE AND STAGE OF PROCEEDINGS

Plaintiffs commenced this lawsuit on February 12, 2015, alleging that 10X infringed U.S. Patent Nos. 7,129,091 (the "'091 patent"), 8,304,193 (the "'193 patent"), 8,329,407 (the "'407 patent"), 8,822,148 (the "'148 patent"), and 8,889,083 (the "'083 patent"), and the now-cancelled U.S. Patent No. 8,273,573 (the "'573 patent") (the "Ismagilov patents"). D.I. 1.

The Court construed claim terms in orders dated February 3, 2017 and May 30, 2017. D.I. 121; D.I. 179. Those orders set forth constructions for the specific terms disputed by the parties. D.I. 116; D.I. 174. The parties did not dispute the meaning of the '407 patent claims' requirement that a reaction involving a biological molecule must occur in "at least one plug" that is "substantially surrounded by the immiscible carrier fluid ***flowing through the channel***." Ex. A ('407 patent), claim 1 (emphasis added). That same requirement also appears in the asserted claims of the '193 patent. Ex. B ('193 patent), claim 1. As a result, the Court did not construe this claim language during claim construction, which is clear on its face. With respect to the term "microfluidic system," the Court ruled that this term is not limited to a "substrate," but the Court did not determine which steps in 10X's workflow a person of skill in the art ("POSA") would regard as being part of a "microfluidic system."

Discovery is now complete, D.I. 165; D.I. 225, and has confirmed that none of the Accused Products[1] performs a reaction—let alone a reaction involving a biological molecule—in a plug "substantially surrounded by immiscible carrier fluid ***flowing through the channel***." In addition, there are at least factual disputes as to whether a POSA would regard every step in 10X's workflow—from the collection of a sample to the incubation of 10X's "GEMs" in a third-party thermocycler after they have been manually removed to a separate, 96-well plate—to be

[1] The Accused Products are 10X's GemCode Long-Read, GemCode Single Cell, Chromium Genome/Exome, Chromium Single Cell 3', and Chromium Single Cell V(D)J.

part of the claimed "microfluidic system," as Plaintiffs contend.

## II. SUMMARY OF ARGUMENTS

Plaintiffs seek summary judgment that 10X directly infringes claims 1, 10, and 11 of the '407 patent,[2] and that the '083 patent is not anticipated or obvious.

**Non-Infringement of the '407 Patent:** Plaintiffs' motion for summary judgment of infringement should be denied. In fact, no reasonable jury could find that use of the Accused Products results in a reaction involving a biological molecule in "at least one plug" that is "substantially surrounded by the immiscible carrier fluid flowing through the channel," as claimed in the '407 patent.

During claim construction, the parties disputed whether the claim terms "reaction" and "microfluidic system"—one or both of which appear in all asserted claims—universally limited the claims of the Ismagilov patents to reactions on the substrate (i.e., the microfluidic chip). D.I. 116. The Court found that they did not. *Id.* Accordingly, 10X's experts, Drs. Quackenbush and Huck, do not argue that all claims of the Ismagilov patents, across the board, are limited to reactions on the substrate. Instead, they present non-infringement opinions either based on the Court's claim constructions (for the claim terms the Court addressed in its claim construction orders) or the plain and ordinary meaning of the claims (for the claim language that the parties did not dispute, and hence that the Court thus did not address in its orders).

By their plain language, the claims of the '407 patent (and also the'193 patent, but none of the other Ismagilov patents) require that a reaction involving a biological molecule occur "in the at least one plug" that is "substantially surrounded by the immiscible carrier fluid [(or an oil)]

[2] Plaintiffs allege that 10X directly infringes the claims of the '407 patent through 10X's own use of the Accused Products. D.I. 85, ¶ 59. Plaintiffs' motion for summary judgment only addresses direct infringement and not induced or contributory infringement.

flowing through the channel." Ex. A ('407 patent), claim 1. This language was not addressed by the Court—or even raised by the parties—during claim construction. Nor should it have been—the claim language is clear on its face. Plaintiffs' own expert, Dr. Sia, agrees. In arguing that the asserted claims of the '407 patent are not invalid in light of a certain prior art reference, Dr. Sia distinguishes that prior art reference as failing to disclose carrier fluid continuously flowing "***during the entire process***," including the claimed reaction. Ex. C (Sia Report II), ¶ 114 (emphasis added); *see also id.* ¶ 120. But that carrier fluid does not continuously flow during the entire process in 10X's Accused Products, either.

The undisputed facts show that the reactions involving biological molecules in 10X's Accused Products do not occur in "at least one plug" that is "substantially surrounded by the immiscible carrier fluid flowing through the channel." Instead, as Plaintiffs concede, these reactions occur outside of the channel. Specifically, these reactions occur after the instrument run is complete and the GEMs have been transferred from the outlet well of the chip to a 96-well plate that in turn is placed within a thermocycler. The 96-well plate does not include a "channel" or any other means through which carrier fluid could "flow." Thus, these reactions in the 96-well plate within a thermocycler do not and cannot occur as the plug is surrounded by a carrier fluid "flowing" through a "channel."

Like the prior art Dr. Sia distinguishes from the asserted claims of the '407 patent, carrier fluid is not continuously flowing "***during the entire process***" in 10X's Accused Products. And there is no genuine dispute that the [redacted] is not a reaction involving a biological molecule at all.

For these reasons alone, the Court should deny Plaintiffs' motion for summary judgment of infringement of the '407 patent and grant 10X summary judgment of non-infringement of the

'407 patent under Rule 56(f). Further, because the asserted claims of the '193 patent similarly require an "autocatalytic reaction" in "at least one plug" that is "substantially surrounded by an oil flowing through the channel," the Court should also grant summary judgment of non-infringement of the '193 patent pursuant to its authority under Rule 56(f).

But Plaintiffs are not entitled to summary judgment of infringement even if the Court does not enter summary judgment of non-infringement for 10X. At minimum, there is a factual dispute concerning the "microfluidic system" limitation. Plaintiffs' expert has offered an opinion that the "microfluidic system" relating to the Accused Products includes everything from the collection of a sample, to the incubation of 10X's "GEMs" in a third-party thermocycler after they have been manually removed to a separate, 96-well plate, to the sequencing of the sample on a third-party sequencer after the GEMs have been broken, and even to the analysis of the resulting sequencing data. 10X's expert disputes this opinion. There is at least a factual dispute as to whether a POSA would regard the claimed "microfluidic system" as extending to users' use of third-party equipment that is separate from the Accused Products.

**Anticipation and Obviousness of the '083 Patent:** 10X reaffirms its position that estoppel only applies to grounds on which the PTAB actually institutes, *see Verinata Health, Inc. v. Ariosa Diagnostics, Inc.*, No. 12-cv-05501-SI, 2017 WL 235048, at *3 (N.D. Cal. Jan. 19, 2017), and incorporates its prior argument. 10X understands that the Court has ruled to the contrary, and thus does not repeat that same argument here but preserves the issue for appeal.

## III. STATEMENT OF FACTS

### A. The '407 Patent

The Ismagilov patents claim methods and systems for creating "plugs" (or droplets) and conducting reactions within those "plugs." D.I. 243 at 3. The '407 patent includes a single independent claim—claim 1. This claim is directed to a method of conducting a reaction in a

plug "substantially surrounded by the immiscible carrier fluid flowing through the channel." Ex. A ('407 patent), claim 1. The "reaction" carried out in this plug is "a reaction involving the at least one biological molecule" and a "reagent for conducting the reaction with the at least one biological molecule:"

> [1P] A method for conducting a reaction in plugs in a microfluidic system, comprising the steps of:
>
> [1A] providing the microfluidic system comprising at least two channels having at least one junction;
>
> [1B] continuously flowing an aqueous fluid containing at least one biological molecule and at least one reagent for conducting the reaction between the biological molecule and the at least one reagent through a first channel of the at least two channels;
>
> [1C] continuously flowing a carrier fluid immiscible with the aqueous fluid through the second channel of the at least two channels;
>
> [1D] forming at least one plug of the aqueous fluid containing the at least one biological molecule and the at least one reagent by partitioning the aqueous fluid with the flowing immiscible carrier fluid at the junction of the at least two channels, ***the plug being substantially surrounded by the immiscible carrier fluid flowing through the channel***, wherein the at least one plug comprises at least one biological molecule and the at least one ***reagent for conducting the reaction with the at least one biological molecule***; and
>
> [1E] providing conditions suitable for the ***reaction in the at least one plug involving the at least one biological molecule and the at least one reagent to form a reaction product.***

Ex. A ('407 patent), claim 1 (emphasis added). The claims of the '193 patent are similarly directed to a method of performing a reaction in "at least one plug" that is "substantially surrounded by an oil flowing through the channel." Ex. B ('193 patent), claim 1. The reaction in "the at least one plug" is an "autocatalytic reaction." *Id.*

### B. The Accused Products

As described in 10X's Opening Brief in Support of Motion for Summary Judgment, 10X's proprietary reactions modify short DNA strands to include an artificial sequence called a

"barcode," which identifies the short strands as all having come from the same larger DNA molecule (GemCode Long Read and Chromium Genome/Exome) or from the same cell (GemCode Single Cell, Chromium Single Cell 3', and Chromium Single Cell V(D)J). D.I. 243 at 5-6. These reactions occur in GEMs. *Id.* An overview of 10X's product workflow appears below:

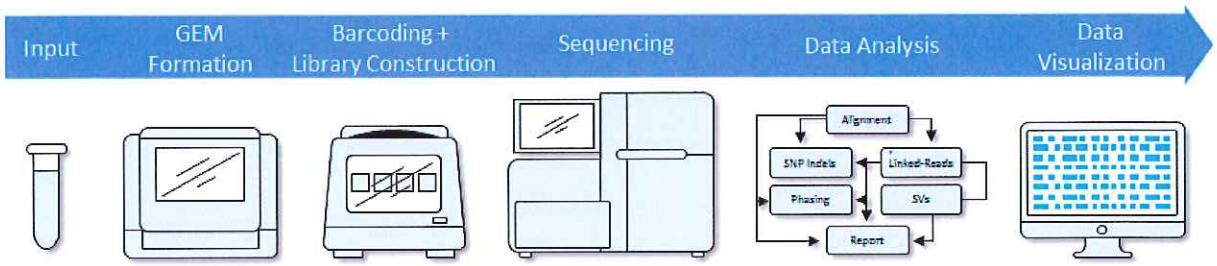


**Figure 1**

GEMs are formed after a user loads fluids into the wells of a microfluidic chip, which is then inserted into a 10X instrument to begin a "run." *Id.* The instrument runs for the Accused Products range from six to twenty minutes, during which 100,000 to over a million droplets, or "GEMs," form, depending on the product. *Id.* During an instrument run, a subset of the "GEMs" formed contain the user's sample (DNA or single cells depending upon the product), reaction buffer, and reaction components, including a "gel bead."

The gel beads act as 10X's barcode delivery vehicle. Ex. D (Quackenbush Report), ¶ 104. [redacted] (indisputably not a biological molecule). [redacted]. *Id.*, ¶ 171.

[redacted]

[redacted]. *Id.*, ¶ 172.

A [redacted] "barcodes" (short sequences of nucleotides) are attached to each gel bead. *Id.*, ¶¶ 104, 172.

After the GEMs are formed, they are manually transferred to an Eppendorf 96-well plate and then placed in a thermocycler. A thermocylcer is a common laboratory instrument sold by third parties, including Plaintiff Bio-Rad (but not 10X), which provides precise heating and cooling. There, in the 96-well plates inside the thermocycler, the gel beads are dissolved and 10X's proprietary barcoding reactions occur. *Id.*, ¶ 105.

As depicted in **Figure 3**, [redacted]

[redacted]. *Id.*, ¶ 174.

[redacted]

After thermal cycling in a third-party thermocycler, the GEMs are broken (i.e., the GEMs

burst open so that the contents of all the GEMs mix forming a single aqueous fluid) and the short, barcoded strands are isolated and further modified for sequencing on an Illumina sequencer. *See, e.g.*, Ex. E (Huck Report), ¶¶ 68, 72, 79. The sequencing data obtained can then be analyzed and visualized.

## IV. ARGUMENT

### A. Non-Infringement Of The '407 Patent

#### *1. The Claims Require That A Biological Reaction Occur In "The At Least One Plug" That Is "Substantially Surrounded By The Immiscible Carrier Fluid Flowing Through The Channel"*

During claim construction, the Court determined that the term "microfluidic system" was not "limited or the equivalent of a 'substrate,'" D.I. 116 at 7, that the term "reaction" does not "limit[] the location where 'reactions' occur to the substrate," *id.* at 10; see also *id.* at 9, 11, and that the preambles of the '407 and '193 patents are "limiting only to the extent that [they] provide[] an antecedent basis for the claim terms 'microfluidic system' and 'reaction'" but do not "limit the method such that the reaction takes place 'in the substrate.'" *Id.* at 12-13.

10X does not seek to reargue these issues. Nowhere do Drs. Quackenbush or Huck set forth alternative claim constructions or argue that these terms of the Ismagilov patents limit the location of the claimed reactions to the substrate. *See, e.g.*, Ex. D (Quackenbush Report), ¶ 57; Ex. E (Huck Report), ¶¶ 58, 158; Ex. F (Quackenbush Tr.) at 225:14-19 ("Reaction is a term which is defined by the court and so we have to firmly define what we mean by 'reaction.' The court tells us the location of the reaction is not limited to the substrate and the microfluidic system above is not limited to or equivalent to the substrate."); Ex. G (Huck Tr.) at 204:18-23 ("From my understanding of the claim construction by the court, the court has said that the microfluidic system is not limited to or equivalent of a substrate, and that the reaction, it added

that the location of the reactions is not limited to the substrate.").[3]

Instead, as the Court instructed, with respect to the claims of the '193 and '407 patents: "[I]t is clear that the reaction in question takes place 'in the at least one plug.'" D.I. 116 at 12-13 (citing Ex. B ('193 patent), claim 1; Ex. A ('407 patent), claim 1). In the context of the '407 and '193 patents, this plug has certain characteristics that are set forth in the body of the claims: ***"[T]he*** at least one plug" comprises "at least one biological molecule and the at least one reagent for conducting the reaction with the at least one biological molecule," or "at least one substrate molecule and reagent for conducting an autocatalytic reaction." Ex. A ('407 patent), claim 1 (emphasis added); Ex. B ('193 patent), claim 1 (emphasis added). Most importantly, "***the*** at least one plug" is "***the*** plug being substantially surrounded by the immiscible carrier fluid [(or an oil)] flowing through the channel." Ex. A ('407 patent), claim 1 (emphasis added); Ex. B ('193 patent), claim 1 (emphasis added). Thus, it is in this "plug"—which the plain language of the claims provides is "substantially surrounded by the immiscible carrier fluid [(or an oil)] ***flowing through the channel***"—that the claimed reactions must occur.

The language requiring that "***the*** at least one plug" is "***the*** plug being substantially surrounded by the immiscible carrier fluid [(or an oil)] flowing through the channel" was not addressed during claim construction. Nor should it have been. The plain language of the claims defines "***the*** at least one plug." And there is nothing in the Court's claim construction order that

[3] Nor do Drs. Quackenbush or Huck suggest that they do not understand the Court's constructions. Dr. Quackenbush did not, as Plaintiffs suggest, "disavow knowledge of the Court's order" during his deposition. D.I. 236 at 23. Despite Dr. Quackenbush's inability to recall the parties' respective arguments during claim construction proceedings, Dr. Quackenbush unquestionably understood the Court's constructions, Ex. F (Quackenbush Tr.) at 225:14-19, and relied on this construction in forming his opinions. Ex. D (Quackenbush Report), ¶ 57. That Dr. Quackenbush "really focused on PCR and the claim construction around PCR" is unsurprising. D.I. 236 at 23. Large portions of Dr. Quackenbush's report analyze whether or not the barcoding reactions in 10X's products are PCR.

precludes 10X from arguing that it does not infringe based on the plain language of the claims that was not construed by the Court. *EMC Corp. v. Pure Storage, Inc.*, 154 F. Supp. 3d 81, 109 (D. Del. 2016) (allowing defendant's expert to testify as to whether certain claim limitations were present in the accused products despite plaintiff's argument that the expert opinion's "directly contradict[ed] the Court's construction of those terms" and holding that "[w]hen a court does not construe a term or orders that ordinary meaning applies, expert testimony on the understanding of a skilled artisan is appropriate to assist the jury").

Plaintiffs try to evade the plain language of these claims by pointing to alternative embodiments in the specification that "expressly teach reactions ***off*** of the chip in droplets that are ***stationary***." D.I. 236 at 23-24. This argument misses the mark. "Claims need not be construed to encompass all disclosed embodiments when the claim language is clearly limited to one or more embodiments." *TIP Sys., LLC v. Phillips & Brooks/Gladwin, Inc.*, 529 F.3d 1364, 1375 (Fed. Cir. 2008) (finding no error in district court's claim construction based on clear language of claim, even though an "alternative embodiment [in specification] does not support the court's construction."). Federal Circuit "precedent is replete with examples of subject matter that is included in the specification, but is not claimed." *Id.* at 1373.[4] Here, it is undisputed that many of the embodiments in the specification teach reactions in droplets as they are surrounded by flowing carrier fluid. *See, e.g.,* Ex. A ('407 patent) at 38:40-64. Based on the plain language unique to these claims, the asserted claims of the '407 and '193 patents are directed to those embodiments. This is entirely consistent with the Court's claim construction order, which

[4] *See, e.g., PSN Ill., LLC v. Ivoclar Vivadent, Inc.*, 525 F.3d 1159, 1167 (Fed. Cir. 2008); *Schoenhaus v. Genesco, Inc.*, 440 F.3d 1354, 1359 (Fed. Cir. 2006); *Maxwell v. J. Baker, Inc.*, 86 F.3d 1098, 1108 (Fed. Cir. 1996); *Unique Concepts, Inc. v. Brown*, 939 F.2d 1558, 1562-63 (Fed. Cir. 1991).

addressed *different claim terms* and concluded that those different terms did not limit *all* claims of the Ismagilov patents, across the board, to reactions on the substrate. D.I. 116.

Plaintiffs next argue that the key claim language at issue here—that the plug is substantially surrounded by carrier fluid flowing through the channel—"simply describes the formation of plugs, and does not require that everything that subsequently takes place in the plugs be under the flow conditions that prevail when the plugs are formed." D.I. 236 at 23. This argument is contradicted by both the plain language of the claims and Plaintiffs' own expert.

The plain language of the claims clearly sets forth (1) how the at least one plug is formed; (2) the characteristics of the at least one plug; and (3) that the claimed reaction takes place in the at least one plug having the claimed characteristics. The plug is formed "by partitioning the aqueous fluid with the flowing immiscible carrier fluid at the junction of the at least two channels." Ex. A ('407 patent), claim 1 (step 1D). Once formed, that same plug is "substantially surrounded by the immiscible carrier fluid flowing through the channel" and comprises the reagents necessary for the claimed reaction. *Id.* The claimed reaction then takes place "in ***the*** at least one plug," which these claims require to be "substantially surrounded by the immiscible carrier fluid ***flowing through the channel***." *Id.* (emphasis added).

Plaintiffs' interpretation would render the language "flowing through the channel" superfluous. This is improper. As the Federal Circuit explained in *Bicon, Inc. v. Straumann Co.*:

> Allowing a patentee to argue that physical structures and characteristics specifically described in a claim are merely superfluous would render the scope of the patent ambiguous, leaving examiners and the public to guess about which claim language the drafter deems necessary to his claimed invention and which language is merely superfluous, nonlimiting elaboration. For that reason, claims are interpreted with an eye toward giving effect to all terms in the claim.

441 F.3d 945, 950 (Fed. Cir. 2006). It is already clear that the plug is formed by "partitioning the aqueous fluid with ***the flowing immiscible carrier fluid*** at the junction of the at least two

channels." Ex. A ('407 patent), claim 1 (step 1D) (emphasis added). The claim ***also*** requires that during the "***reaction in the*** at least one plug," "***the*** plug" is "***the plug being substantially surrounded by the immiscible carrier fluid flowing through the channel***." *Id.* (emphasis added).

Plaintiffs' expert, Dr. Sia, agrees. In opining that a prior art reference—UK Patent Application No. GB 2.097,692 ("*Shaw Stewart*")—does not anticipate the '407 patent, Dr. Sia argues that the claimed method of the '407 patent requires "continuous flow ***during the entire process***" and defines the "entire process" as including the reaction. Ex. C (Sia Report II), ¶ 114 (emphasis added); Ex. H (Sia Tr. II) at 451:18-452:1.

*Shaw Stewart* describes (among other things) conducting reactions by coalescing two droplets. The first droplet contains one reagent, and the second droplet contains another reagent. Ex. I (*Shaw Stewart*), at 1:5-19. When the droplets coalesce (i.e., merge), the reagents are combined and a reaction occurs. *Id.* In order for the droplets to coalesce, the droplets are "moved by the carrier phase" so that the two droplets come into contact. *Id.* at 1:49-53. This movement—and, accordingly, droplet coalescence and reaction—is sometimes accomplished by starting and stopping the flow of carrier fluid. *Id.* at 1:114-121.

For example, as described in connection with Figure 3 of *Shaw Stewart* (copied and annotated on the following page as **Figure 4**), to merge droplet (1) and droplet (2) "[a] current from duct B to duct C is produced" (blue) such that the carrier fluid "carries a droplet (1) to the site of coalescence" (red). *Id.* at 1:114-115. At that point "the valves feeding duct B are closed," thereby stopping the flow of carrier fluid. *Id.* at 1:117-118. "A current from duct A to duct C now carries a second droplet (2) past the first" (green), such that the droplets "are pressed together and coalesce to form a single droplet." *Id.* at 1:114-121.

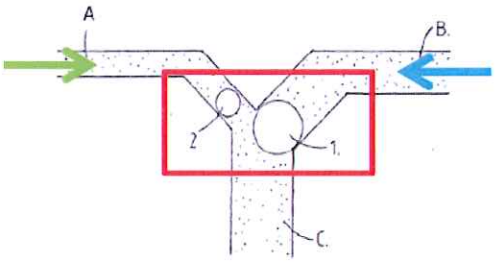

Figure 3

**Figure 4**[5]

Dr. Sia argued that because "*Shaw Stewart* requires that two droplets must coalesce" in order for a reaction to occur, and coalescence in turn requires stopping the flow of carrier fluid, as explained above, *Shaw Stewart* does not disclose "continuous flow during the entire process," but instead only discloses "continuous flow in the formation of" a droplet. Ex. C (Sia Report II), ¶ 114. At deposition, Dr. Sia confirmed that that the "reaction" is "part of the process":

> And my point here in that paragraph was that in order to conduct a reaction [in *Shaw Stewart*], you have to stop – ***the reaction being part of the process that is in that claim***, in order to conduct the process there . . . ***you would have to stop the continuous flow.***

Ex. H (Sia Tr. II) at 451:18-452:1 (emphasis added). Accordingly, as explained by Dr. Sia, *Shaw Stewart* cannot anticipate claim 1 of the '407 patent because "to unite the two droplets, an interruption in flow between the formation of the droplets and their ultimate coalescence must occur." Ex. C (Sia Report II), ¶ 114. Specifically, in reference to Figure 3, Dr. Sia explained "[w]hen the valve of feeding duct B is closed, ***there is no longer the continuous flow of fluids***." *Id.* (emphasis added). As described above, when the "valve of feeding duct B is closed" it is ***the continuous flow of the carrier fluid that is stopped***.[6] Ex. I (*Shaw Stewart*) at 1:109-126. Dr. Sia

[5] This image has been corrected to address a labeling error in the original. *See* Ex. C (Sia Report II), ¶ 116 (noting error).

[6] While Dr. Sia offered this opinion in the section in his report discussing step 1B of the '407 patent, it is clear that Dr. Sia's validity opinion requires that the flow of both "fluids"

thus argued that because *Shaw Stewart* does not disclose "continuous flow" of the carrier fluid during the reaction, it does not anticipate the '407 patent.

As compared to *Shaw Stewart,* it is even clearer in the Accused Products that the continuous flow of carrier fluid is stopped before the claimed reactions take place. The barcoding reactions on which Plaintiffs rely—the only reactions in the Accused Products that involve a biological molecule—do not take place until the instrument run is complete (and, accordingly, after all flow is stopped) and the GEMs (the alleged "plugs") are manually transferred to an 96-well Eppendorf plate. Such a plate lacks channels or any other means through which carrier fluid could possibly flow.

Plaintiffs cannot argue one claim scope for invalidity and another for infringement. *See, e.g., Amgen Inc. v. Hoechst Marion Roussel, Inc.*, 314 F.3d 1313, 1330 (Fed. Cir. 2003) ("It is axiomatic that claims are construed the same way for both invalidity and infringement."). In both circumstances, the claims of the '407 and '193 patents require that the claimed reactions occur in "the at least one plug" that is "substantially surrounded by the immiscible carrier fluid [(or an oil)] flowing through the channel."

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remain continuous "during the entire process." *See also* Ex. C (Sia Report II), ¶ 113 ("Furthermore, because *Shaw Stewart* requires droplet merger, at some point the purportedly continuous flow described therein must be halted to introduce the second droplet."); ¶ 114 ("Since *Shaw Stewart* requires that two droplets must coalesce, however, the description of continuous flow in the formation of one type of droplet does not equate to continuous flow during the entire process."); ¶ 115 ("To unite the two droplets, an interruption in flow between the formation of the droplets and their ultimate coalescence must occur.").This is abundantly clear when Dr. Sia's opinions regarding *Shaw Stewart* are compared to his opinions regarding *Quake.* While Dr. Sia also contends that *Quake* is limited to droplet merger, as *Quake* describes merging droplets while the carrier fluid is continuously flowing, Dr. Sia does not opine that *Quake* does not disclose "continuous flow during the entire process." *Compare id.*, ¶¶ 87-88 *with id.*, ¶ 114.

2. *10X's Products Do Not Involve A Reaction In "The At Least One Plug" That Is "Substantially Surrounded By The Immiscible Carrier Fluid Flowing Through The Channel"*

**(a)** No "Reaction . . . Involving The At Least One Biological Molecule" Is Performed In "The At Least One Plug" That Is "Substantially Surrounded By The Immiscible Carrier Fluid Flowing Through The Channel"

Step 1E of the '407 patent requires "providing conditions suitable for the ***reaction in the at least one plug involving the at least one biological molecule and the at least one reagent*** to form a reaction product. Ex. A ('407 patent), claim 1 (emphasis added). Plaintiffs accuse GemCode Long Read, Chromium Genome/Exome, GemCode Single Cell, Chromium Single Cell 3', and Chromium Single Cell V(D)J (or the use thereof) of infringing the '407 patent. While these products carry out certain reactions in GEMs—[redacted], and the GEM-RT reactions, specifically—Plaintiffs do not provide ***any*** evidence to suggest that [redacted], or the GEM-RT reactions occur "in the at least one plug" that is "substantially surrounded by the immiscible carrier fluid flowing through the channel."[7] And they cannot so argue. As Dr. Sia admits, a thermocycler is necessary for these reactions to occur. *See* Ex. J (Sia Report I), ¶ 124 ("[T]he droplets are collected in a standard Eppendorf tube[8] and placed on a thermal cycler, which is used to provide the suitable temperature conditions ***so that the*** [redacted] ***reaction may occur.***") (emphasis added); *see id.*, ¶ 125 (same process for [redacted] reaction); *see id.*, ¶ 126 (same process for GEM-RT reaction). As the GEMs are transferred to the thermocycler *after* they exit the channel and the instrument run is complete, it is undisputed that the reactions taking place in the thermocyler do not occur in "at least one plug" that is "substantially surrounded by

[7] Plaintiffs have not preserved an argument that the 10X Accused Products satisfy this limitation under the doctrine of equivalents.

[8] As explained above, the GEMs are collected in an Eppendorf 96-well plate, not an Eppendorf tube. Ex. E (Huck Report), ¶ 174.

the immiscible carrier fluid flowing through the channel." Ex. D (Quackenbush Report), ¶¶ 206, 240, 242; Ex. E (Huck Report), ¶¶ 318-338. At the time of these reactions, the GEMs are in wells in a 96-well plate—not channels—and the carrier fluid is not flowing. Ex. E (Huck Report), ¶ 165.

In the alternative, Plaintiffs allege that "10X infringes the '407 patent by carrying out a [redacted]." D.I. 236 at 17. But as explained below, the [redacted] is ***not*** a reaction involving a biological molecule, and does ***not*** occur in "the at least one plug" that is "substantially surrounded by the immiscible carrier fluid flowing through the channel." Plaintiffs do not provide evidence to the contrary.

*(i)* [redacted] *Is Not A Reaction Involving A Biological Molecule*

As an initial matter, the [redacted] is not a reaction involving a biological molecule. The Court has construed "reaction" as a "physical, chemical, biochemical or biological transformation," D.I. 121, ¶ 3, and "biological molecule" as "molecules such as proteins, DNA, RNA, carbohydrates, and sugars." *Id.*, ¶ 9. Step 1E requires a "reaction in the at least one plug involving the at least one biological molecule and the at least one reagent to form a reaction product." Ex. A ('407 patent), claim 1. As defined by step 1D, the "at least one reagent" is a "reagent for conducting the reaction with the at least one biological molecule." *Id.* [redacted]. Ex. J (Sia Report I), ¶ 219.

As depicted in **Figure 5** on the following page, the only "reaction" involved is the

[redacted]

[redacted]:

[redacted]

*See* Ex. K (10X-000136246) at 36; *see also* Ex. J (Sia Report I), ¶ 219. Plaintiffs do not contend that the gel bead itself is a "biological molecule." It is also undisputed that neither the [redacted] *See* Ex. D (Quackenbush Report), ¶ 206; Ex. J (Sia Report I), ¶ 67; *see also* Ex. K (10X-000136246) at 36. On the other hand, the nucleotides making up the barcode—i.e., the only portions of the gel bead that could arguably be characterized as "biological"—do not undergo a "reaction" as construed by the Court—namely, a "physical, chemical, biochemical or biological ***transformation***," D.I. 121, ¶ 3 (emphasis added). *See* Ex. D (Quackenbush Report), ¶¶ 206-07. [redacted] *Id.*

Plaintiffs do not provide evidence to the contrary. Instead, they rely only on the conclusory statements of their expert that [redacted] Ex. J (Sia Report I), ¶ 219. [redacted] *See* Ex. D (Quackenbush Report), ¶¶ 206-07. As depicted **Figure 5**, [redacted] *See also* Ex. D (Quackenbush Report), Fig. 20.

Accordingly, [redacted]

Dr. Sia provides no explanation for ***why*** the [redacted] is a "reaction in the at least one plug involving the at least one biological molecule and the at least one reagent to form a reaction product." Ex. A ('407 patent), claim 1. "[T]he conclusory testimony of an expert witness . . . cannot create an issue of fact if none otherwise exists." *See, e.g., Krippelz v. Ford Motor Co.*, 667 F.3d 1261, 1269 (Fed. Cir. 2012).

Plaintiffs' mischaracterizations of Dr. Quackenbush's deposition testimony are also unavailing. Dr. Quackenbush did not "fail[] to defend" his position that the [redacted] is not a reaction involving a biological molecule. D.I. 236 at 25-26. Plaintiffs conflate Dr. Quackenbush's testimony concerning two very different reactions: [redacted] and GEM-RT. Ex. F (Quackenbush Tr.) at 46:7-48:19. Plaintiffs attempt to pass off Dr. Quackenbush's testimony regarding the barcoding reactions as testimony about the [redacted]. The [redacted], and GEM-RT barcoding reactions are reactions involving biological molecules—10X does not contend otherwise.[9] Dr. Quackenbush's testimony quoted by Plaintiffs *only* concerns the uncontroversial point that the adaptors (i.e., the DNA primers or barcodes) "are reagents ***in the remaining reactions***." *Id.* at 47:3-5 (emphasis added); *see also id.* at 47:1-48:19. The "remaining reactions" to which Dr. Quackenbush referred are the barcode "labeling[]" reactions (i.e., the [redacted], and GEM-RT reactions). *Id.* at 47:21-48:7. The adaptors ***only*** "participate[]" in these "remaining reactions." *Cf.* D.I. 236 at 25. At no point did Dr. Quackenbush contradict his position that:

[9] These reactions do not occur in "the at least one plug" as claimed. *See supra.*

[redacted] does not "involv[e]" the DNA primer. The [redacted] . . . . Even assuming the "DNA primer" is a biological molecule, this reaction does not 'involv[e]' the DNA primer. [redacted]

Ex. D (Quackenbush Report), ¶¶ 206-07.

*(ii)* [redacted] *Does Not Occur In "The At Least One Plug" That Is "Substantially Surrounded By The Immiscible Carrier Fluid Flowing Through The Channel"*

Finally, even assuming the [redacted] is a "reaction . . . involving the at least one biological molecule and the at least one reagent to form a reaction product," Plaintiffs do not provide ***any*** evidence that this reaction occurs in "the at least one plug" as claimed.

[redacted] Ex. L (Lowe Tr.) at 101:15-25. However, as depicted in **Figure 6** ([redacted]

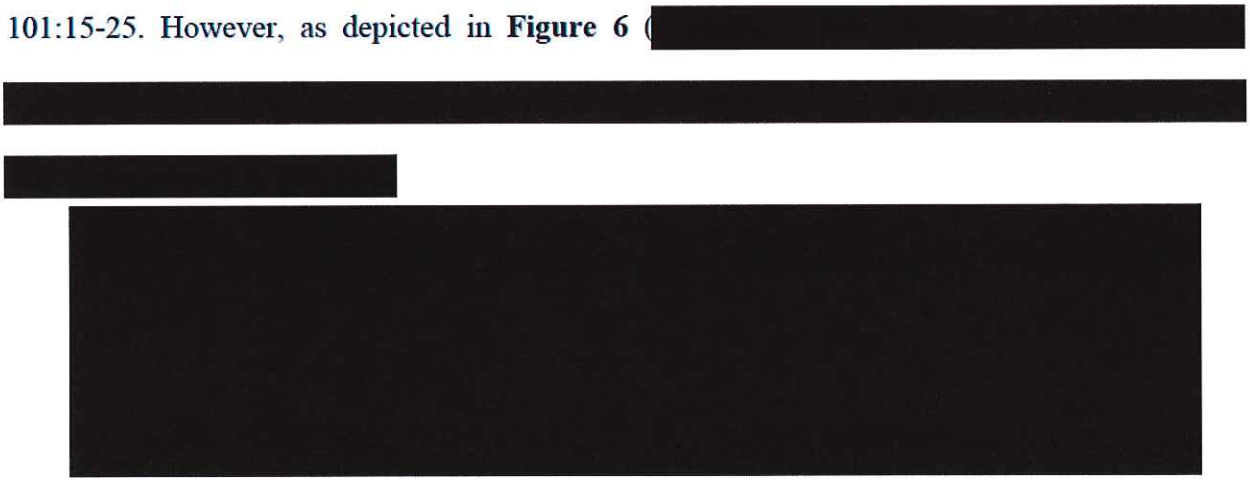

**Figure 6**

Ex. K (10X-000136246) at 4; *see also* Ex. D (Quackenbush Report), ¶ 175; *see also* Ex. L (Lowe Tr.) at 101:15-25 [redacted]

[redacted].”). GEMs are “substantially surrounded by the immiscible carrier fluid flowing through the channel” [redacted] Ex. E (Huck Report), ¶ 325.

Plaintiffs provide no evidence to the contrary. Dr. Sia has speculated that [redacted].” Ex. M (Sia Tr. I) at 214:22-25 (“But I think in general, these reactions will start immediately when the reagents come in contact with each other.”); *id.* at 209:21-25 (“But I’m certain that the moment that the solutions come together you’re going to see a very significant fraction of those [redacted].”). But these statements are mere speculation:

> And I was trying to say, look, ***even if you don’t know the rates***, because often people don’t characterize it in that level of detail and it’s not necessary, you know, it would be helpful to know which are the rate limiting steps. And, you know, in such a case ***my suspicion*** is the initial, you know, that initial event happens very quickly, because the two fluid streams are aqueous.

Ex. H (Sia Tr. II) at 315:9-19 (emphasis added). Mere speculation and suspicion is not evidence and cannot defeat summary judgment. *Lucent Techs., Inc. v. Gateway, Inc.*, 543 F.3d 710, 723 (Fed. Cir. 2008) (affirming grant of summary judgment of non-infringement where patentee’s evidence “established only uncertainty and speculation” as to whether infringement had occurred); *Sitrick v. Dreamworks, LLC,* 516 F.3d 993, 1001 (Fed. Cir. 2008) (“Conclusory expert assertions cannot raise triable issues of material fact on summary judgment.”).

In fact, Dr. Sia’s speculation only confirms that this reaction does not occur in a plug “substantially surrounded by the immiscible carrier fluid flowing through the channel.” When asked “[h]ow quickly” this reaction occurs, Dr. Sia was only able to speculate: “I would say seconds, at the latest.” Ex. M (Sia Tr. I) at 209:2-10; *see also id.* at 212:8-12 (“But, you know, something that is [redacted].”). But each GEM is only in the

channel [redacted]. Ex. E (Huck Report), ¶ 325. [redacted], even Dr. Sia's unsupported speculation that the [redacted] occurs within "seconds" does not come close to establishing that any reaction occurs within milliseconds, as would be required for the reaction to occur in a plug "substantially surrounded by the immiscible carrier fluid flowing through the channel."[10]

In sum, Plaintiffs have failed to satisfy their burden of proof with respect to infringement of the '407 patent claims. The Court should thus grant summary judgment of non-infringement of the '407 patent pursuant to Rule 56(f), thereby removing this patent from the case.

*3. No "Autocatalytic Reaction" Is Performed In "The At Least One Plug" That Is "Substantially Surrounded By The Immiscible Carrier Fluid Flowing Through The Channel"*

The same plain language also appears in the '193 patent. Step 1E of the '193 patent requires "providing conditions suitable for the ***autocatalytic reaction in the at least one plug*** such that the at least one substrate molecule is amplified" where the at "at least one plug" is "substantially surrounded by an oil flowing through the channel." Ex. B ('193 patent), claim 1. Plaintiffs accuse only GemCode Long Read and Chromium Genome/Exome (or the use thereof) of infringing the '193 patent—not the single cell products—alleging that these products "carry out autocatalytic reactions in plugs that lead to amplification of a substrate nucleic acid molecule." Ex. J (Sia Report I), ¶ 222. Specifically, Plaintiffs allege that [redacted] are autocatalytic reactions. *Id.*, ¶¶ 234, 254. They are not. Ex. D (Quackenbush Report), ¶¶ 196-205, 231-38. Regardless, as discussed above, these reactions do not occur in "at least one plug" that is "substantially surrounded by an oil flowing through the channel." And Plaintiffs have not

[10] During his deposition, Dr. Sia also speculated that a change in the shape of GEMs was a "strong indicator" that a reaction was taking place. Ex. M (Sia Tr. I) at 216:3-22. Again, this speculation cannot create a factual dispute. Dr. Sia could not even specify which reaction this indicates. *Id.* ("And it's I think a strong indicator that there's some sort of reaction going on.").

provided any evidence to the contrary. As no reasonable jury could find for Plaintiffs on this issue, the Court should grant summary judgment of non-infringement of the '193 patent pursuant to Rule 56(f), thereby removing this patent from the case, as well.

*4. Factual Disputes Remain Regarding The Scope of the "Microfluidic System"*

At minimum, there is a factual dispute over the "microfluidic system" limitation, and in particular over whether a POSA would regard the claimed "microfluidic system" as extending to 10X users' use of third-party equipment, such as a Bio-Rad thermocycler and an Eppendorf well plate, that is separate from the Accused Products. To prove infringement, Plaintiffs must establish that use of 10X's Accused Products involves performing each step of claim 1 of the '407 patent. Because a factual dispute exists regarding the "microfluidic system" limitation, Plaintiffs are not entitled to summary judgment of infringement. But because "at least one plug" limitation is not met in the Accused Products for the reasons explained above, 10X is entitled to summary judgment of non-infringement regardless of the Court's ruling on the "microfluidic system" issue.

During claim construction, the Court found the entire preamble not limiting, but "[t]he terms 'reaction' and 'microfluidic system' . . . limiting as previously construed." D.I. 116 at 12. The dispute with respect to "microfluidic system" centered on whether it was limited solely to the "substrate." *Id.* at 6-7. The Court determined it was not, construing it as "a system comprised of at least one substrate having a network of channels of micrometer dimension through which fluid may be transported." *Id.* at 6. So construed by the Court, the term "microfluidic system" limits the claimed method (but not to a "substrate"). That is, the method of claim 1 is carried out in a microfluidic system.

Dr. Sia himself agrees. In his infringement report, Dr. Sia argues that "10X's GemCode™ Long-Read performs the [redacted] reaction in plugs in microfluidic systems." Ex. J (Sia Report I), ¶ 124; *see also id.*, ¶¶ 125-126 (contending the same for the Chromium Genome/Exome and Single Cell products). First noting that "the Court has construed the terms 'microfluidic system' and 'reaction' in these preambles to be limiting," *id.*, ¶ 123, Dr. Sia contends that the Accused Products satisfy this limitation by extending the "microfluidic system" to encompass the third party thermocycler, "which is used to provide the suitable temperature conditions so that the [redacted] reaction may occur." *Id.*, ¶ 124; *see also id.*, ¶¶ 125-126 (contending the same for the Chromium Genome/Exome and Single Cell products). In rebutting this opinion, 10X's expert, Dr. Huck, argues that the "microfluidic system" only encompasses the Accused Products themselves (which include more than just a microfluidic chip or substrate), but does not include separate third party products such as a thermocycler. Ex. E (Huck Report) at ¶¶ 159-164. Both experts, therefore, opine on a common issue.

Indeed, prior to their summary judgment motion, Plaintiffs consistently interpreted the Court's claim construction ruling as requiring the method of claim 1 to take place within the "microfluidic system"—and specifically relied on the "microfluidic system" limitation in an effort to distinguish the Ismagilov patents from the prior art. For example, with regard to three prior art references 10X raised in its invalidity contentions, Plaintiffs contended that the references were irrelevant because "[t]he person of ordinary skill in the art would not have looked to these references for guidance regarding ***how to conduct reactions in droplets in a microfluidic system***." Ex. N (Plaintiffs' First Suppl. Response to 10X's Rog Nos. 3, 6, 9, 13, and 21, dated July 21, 2017) at 17 (emphasis added). Dr. Sia took an identical position in his validity expert report. In attempting to rebut an argument that U.S. Patent Application Publication

2002/0058332 ("*Quake*") anticipates the '407 patent, Dr. Sia contended that:

> ***Quake fails to teach and enable Claim 1's preamble***: "[a] method for conducting a reaction in plugs in a microfluidic system." This is because *Quake* is directed toward a different invention than the Chicago Patents. Rather than being directed to "conducting a reactions in plugs," *Quake* addresses the sorting of biological materials enveloped in plugs possessing particular qualities within a microfluidic device. . . . ***None of Quake's claims are directed to conducting reactions in plugs in microfluidic devices***.

Ex. C (Sia Report II), ¶ 84 (emphasis added). Dr. Sia's rebuttal report is littered with similar attempts to distinguish the prior art based on the "microfluidic system" limitation. *See, e.g.*, *id.*, ¶ 188 ("First, there is no discussion in *Corbett* that the reactions are intended to be conducted in a microfluidic system."); *id.*, ¶ 235 ("First, there is no discussion in *Wang* that the reactions are intended to be conducted in a microfluidic system."); *id.*, ¶ 640 (Asserted "claims embody these novel elements, reciting methods for generating and using microfluidic systems for carrying out chemical reactions in droplets, or 'plugs,' in microfluidic systems."). Plaintiffs cannot take inconsistent positions with regard to validity and infringement. *Amgen*, 314 F.3d at 1330.

While the Court's construction made clear that the "microfluidic system" encompasses more than just the "substrate," a factual dispute now exists regarding how much of 10X's workflow a POSA would regard as being part of a "microfluidic system." Therefore, the question remains: beyond the "at least one substrate having a network of channels of micrometer dimension," is there any limit at all on the "microfluidic system"?

Plaintiffs would answer that question with a resounding "no." Their summary judgment brief argues that "[a]s long as a system ***comprises*** 'at least one substrate having a network of channels of micrometer dimension through which fluid may be transported,' it is a 'microfluidic system' under the Court's claim construction." D.I. 236 at 12. This understanding of "microfluidic system" would encompass *any* component—no matter how removed from the microfluidic chip itself—as long as, at some point, the process included a microfluidic chip. This

position quickly devolves into absurdity. For example, Dr. Sia testified that, for the Accused Products, "***anything*** that is in the workflow where you involve droplets that are made by the microfluidic chips is part of the microfluidic system." Ex. M (Sia Tr. I) at 198:1-5 (emphasis added). This "workflow" is not limited by geography, *id.* at 200:16-201:7, or time, *id.* at 205:19-206:21. As an example, Dr. Sia pointed to his own work in blood-based diagnostics. In that instance, the workflow—and thus, for Dr. Sia, the "microfluidic system"—would also include "all the steps into collecting the blood sample, for instance. That part, that step, for example, would be completely central to the workflow." *Id.* at 206:12-18. Under Dr. Sia's formulation of the "microfluidic system," therefore, the system would include the person from whom blood is collected and the person collecting the blood. Those people certainly never envisioned themselves as being part of a "microfluidic system."

The context of 10X's Accused Products again exposes the unreasonableness of Plaintiffs' argument. Dr. Sia contends that every step and every device that takes part in 10X's workflow comprises the "microfluidic system." This at least includes:

- The 96-well plate used to deposit the GEMs after the user has pipetted the GEMs out of the microfluidic chips (illustrated in **Figure 7**), Ex. M (Sia Tr. I) at 197:22-198:5;

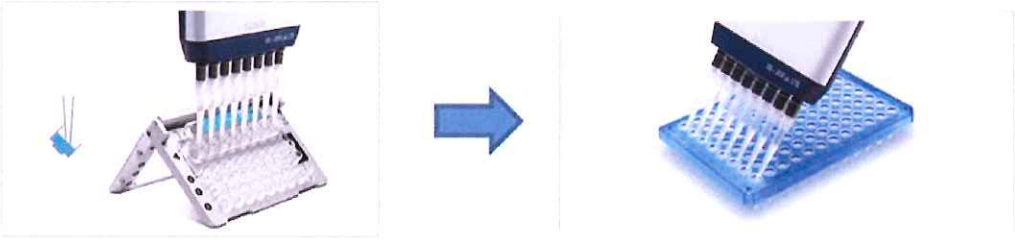

**Figure 7**

Ex. E (Huck Report), ¶ 165 (user pipetting the GEMs out of the microfluidic chip); *id.* (user pipetting the GEMs into the 96-well plate).

- The Bio-Rad thermocycler 10X recommends customers use to incubate the GEMs, in which the [redacted], and GEM-RT reactions occur, Ex. M (Sia Tr. I) at 198:6-15; *see also See* Ex. O (GemCode™ User Guide) at 10X-000000414; Ex. P (GemCode™

> Single Cell 3' User Guide) at 10X-000000092; Ex. Q (Chromium™ Genome Reagent Kits v2 User Guide) at 10X-000249149; Ex. R (Chromium™ Single Cell 3' Reagent Kits User Guide) at 10X-000064670; Ex. S (Chromium™ Single Cell V(D)J Reagents User Guide) at 10X-000256300;

- The Illumina sequencer used to determine the sequence of the DNA fragments, which occurs *after* the GEMs cease to exist (i.e., the aqueous fluid is no longer surrounded by oil and the DNA is collected in bulk), *id.* at 196:11-19; and
- The 10X software used to analyze the results of the sequencing. *Id.* at 203:17-204:6.

The last two steps of 10X's workflow occur after—even *long* after—the GEMs are "broken" and the droplets no longer exist. And of course, these steps are far removed from the microfluidic chip on which the GEMs form. Nevertheless, Plaintiffs and Dr. Sia would still consider the methods and devices that take part in those steps as comprising the "microfluidic system."

But in order for the term "microfluidic system" to impart *any* meaning to the claims, there must be some limit to it. Contrary to Plaintiffs' arguments, Dr. Huck's understanding of the "microfluidic system" is not limited to the "substrate" itself. Rather, as Dr. Huck describes in his report, "a 'microfluidic system' may also contain ***devices*** physically connected to the 'substrate,' whether or not those devices are later removed." Ex. E (Huck Report), ¶ 159 (citing D.I. 116 at 7) ("In other words, devices are manufactured from one or more substrates and devices are used to build microfluidic systems."). Notably, Dr. Huck's opinion encompasses *all* devices that are physically connected to the "substrate." While this includes capillary tube examples described by the Ismagilov patents, as 10X argued during claim construction, D.I. 93 at 17-19, it also covers other types of devices, such as microscopes, that are physically connected to the chip. Using this definition, Dr. Huck opines that in the Accused Products, the "microfluidic system"

> encompasses the GemCode™ or Chromium™ instruments, the microfluidic chips, and the fluids that are introduced into the chips (while they are present in the chip). . . . These elements are each part of the "microfluidic system" because they are interconnected with the microfluidic chip (or using the language of the Ismagilov patents, the "substrate") such that they make up a "system compris[ing]

> at least one substrate." For example, the 10X GemCode™ and Chromium™ instrument is part of the system because the microfluidic chip is placed within, and connected to, the instrument.

Ex. E (Huck Report), ¶¶ 162-63.

Essentially, therefore, the parties dispute whether a POSA would deem the "microfluidic system" to include *more* components of 10X's workflow than just the Accused Products. 10X's workflow includes later products and instruments sold by third parties, including Bio-Rad itself. As described above, after the GEMs are generated within the 10X instruments, 10X's User Guides recommend that the user pipette the GEMs out of the microfluidic chip and into an Eppendorf twin.tec® 96-well plate. *See, e.g.*, Ex. O (GemCode User Guide) at 10X-000000431; Ex. Q (Chromium User Guide) at 10X-000249170-72; Ex. R (Chromium Single Cell 3' User Guide) at 10X-000064688-89. This Eppendorf-branded 96-well plate is then placed within a Bio-Rad C1000 Touch™ Thermal Cycler for incubation. *See, e.g.*, Ex. O (GemCode User Guide) at 10X-000000433; Ex. Q (Chromium User Guide) at 10X-000249173; Ex. R (Chromium Single Cell 3' User Guide) at 10X-000064690. While Dr. Sia argues that these products—and a host of other products sold by third parties—are encompassed by the term "microfluidic system," Dr. Huck opines that a POSA would *only* consider the Accused Products (i.e., the instruments, microfluidic chips, and reagents ***sold by 10X***) to be part of a "microfluidic system." Ex. M (Sia Tr. I) at 198:1-5; Ex. E (Huck Report), ¶¶ 162-64. This presents a significant factual dispute between the parties.

Dr. Huck's opinion is perfectly congruent with both the specification and the Court's claim construction ruling. Though Plaintiffs argue that Dr. Huck's report is inconsistent with the specification because "the specification repeatedly describes components that are undeniably part of the 'microfluidic system,' yet are not 'physically connected' to the chip or substrate," Plaintiffs cannot point to a single example incompatible with Dr. Huck's opinion. D.I. 236 at 14-

16. For example, Plaintiffs point to incubators, microscopes, mass spectrometers, x-ray synchrotrons, and computers. *Id.* During their use, however, these devices are all at some point physically connected to the microfluidic substrate.[11] Like the GemCode and Chromium instruments, the microfluidic chip is "placed within, and connected to," these devices. Ex. E (Huck Report), ¶ 163. Because these devices are interconnected with the substrate, they are part of the "microfluidic system" in accordance with both Dr. Huck's opinion and the specification of the Ismagilov patents.

Plaintiffs point to Dr. Huck's deposition testimony to argue that Dr. Huck contends that "scientific components could only qualify as part of the 'microfluidic system' if they are 'part of' the microfluidic 'chip itself.'" D.I. 236 at 16. But the testimony cited by Plaintiffs is excerpted from a larger discussion of Example 20 from the '407 patent, which describes experimental set-up procedures using capillary tubes.[12] As Example 20 in the '407 patent states: "After establishing alternating aqueous droplet streams in the capillary, the flows were stopped, and the capillary was disconnected from the PDMS device, sealed with wax and stored in an incubator at

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[11] *See, e.g.*, Ex. A ('407 patent) at 55:39-48 ("First, plugs are preferably formed wherein the concentrations of the protein, precipitant, and additive are adjusted by varying the relative flow rates of these solutions. . . . Second, the flow is preferably stopped once the desired number of plugs are formed. The plugs are then preferably allowed to incubate."); *id.* at 70:11-15 ("The channels were designed to wind so that rapid chaotic mixing was induced, and were designed to fit within the field of view of the microscope so that the entire reaction profile could be measured in one spatially resolved image."); *id.* at 33:58-59 ("In another embodiment, plugs are detected following their exit through a channel point leading to a mass spectrometer."); *id.* at 52:1-5 ("[A] PDMS membrane defining two side walls of the channels could be sandwiched between two very thin glass plates (defining the top and bottom walls of the channels) that do not significant scatter X-rays."); *id.* at 31:65-67 ("A computer is preferably used to digitize the PMT signal and to control the flow through methods such as those based on valve action.").

[12] To be clear, Example 20 in the '407 patent does not even describe a "reaction with a biological molecule." Instead, it sets out experimental parameters "that are predicted to facilitate protein crystallization." *See, e.g.*, Ex. A ('407 patent) at 77:48-50. While Example 20 does describe plugs containing chemical compounds and colored dyes, there is not reaction involving a "biological molecule." *Id.*, Example 20.

18°C." Ex. A ('407 patent) at 77:35-38. In this context, Dr. Huck testifies that "if the chips, including the capillaries, were really designed to be split into this PDMS part and capillary part, then I would say that capillary ***could be part of the chip***, could be part of the microfluidic chip and therefore still part of the microfluidic system." Ex. G (Huck Tr.) at 142:14-20 (emphasis added). Dr. Huck's testimony regarding "materials need[ing] to be part of the microfluidic chip" thus concerns the capillary tubes, which *are* described by the '407 patent as integrating with the chip. *Id.* at 143:3-11.

Further, Plaintiffs' argument that 10X's Accused Products satisfy the preamble of the '407 patent even if it requires reactions to take place on the chip—which 10X is not contending—falls far short of establishing infringement. Plaintiffs have not presented evidence sufficient to prove that a reaction occurs in the "microfluidic system" by a preponderance of the evidence.[13] Plaintiffs argue that the [redacted] on the chip. 10X does not dispute that the chip, including the outlet well, is part of the "microfluidic system." But Plaintiffs have not proffered sufficient evidence to establish that any reaction, let alone a reaction involving a biological molecule, occurs on the chip.

As an initial matter, for the reasons set forth above, Plaintiffs have not established that the [redacted] is a reaction with a biological molecule, or that it occurs "on chip." *See* Section IV.A.2.(b). As Dr. Huck explained in his report, the [redacted] occurs ***after*** an Accused Product completes an instrument run. Ex. E (Huck Report), ¶ 93 ("[T]he [redacted] occurs over several minutes ***after an instrument run is complete.***") (emphasis added). The image cited in Plaintiffs' brief demonstrates this clearly—the [redacted]

[13] It is undisputed that [redacted], and the GEM-RT reactions occur after the GEMs have been transferred from the chip to a thermocycler. Ex. J (Sia Report I), ¶¶ 124-26. As discussed above, the parties dispute whether the thermocycler, and other portions of the workflow outside of the Accused Products, constitute the "microfluidic system."

[redacted], which occurs after the GEMs have already formed (*i.e.*, after the instrument run is complete). D.I. 236 at 17; Ex. M (Sia Tr. I) at 212:23-213:17.

While the [redacted], Plaintiffs have not established that 10X's Accused Products satisfy the preamble of the '407 patent even if it requires reactions to take place on the chip. Similarly, Dr. Adam Lowe, a scientist at 10X, testified that:

[redacted]

Ex. L (Lowe Tr.) at 101:15-25. As Dr. Lowe testified, [redacted] *Id.* Plaintiffs have not satisfied their burden of proving infringement based on this limitation.

Pursuant to Rule 56(f), the Court should grant summary judgment that the use of 10X's Accused Products does not infringe the '407 patent. Even if the Court disagrees regarding the claims' requirement that the "plug" be "substantially surrounded by the immiscible carrier fluid flowing through the channel," there is—at a minimum—a material factual dispute as to whether the Accused Products conduct a reaction in a "microfluidic system." A reasonable jury could readily agree with Dr. Huck that a POSA would not regard a third-party thermocycler and Eppendorf 96-well plate to be part of a "microfluidic system" as claimed. As a result, summary judgment of infringement of the '407 patent is inappropriate.

## V. CONCLUSION

For the reasons set forth above, the Court should deny Plaintiffs' motion for summary judgment of infringement of the '407 patent, and grant summary judgment of non-infringement of the '407 and '193 patents pursuant to Rule 56(f).

| | |
|---|---|
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**CERTIFICATE OF SERVICE**

I hereby certify that on December 4, 2017, I caused true and correct copies of the foregoing document to be served on the following counsel in the manner indicated:

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